



**Joan C. Edwards School of Medicine
Marshall University
“Training Tomorrow’s Physicians for the Management
of Cancer through Innovative Educational Program”**

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Abstract

As part of a national effort to address shortages in the cancer workforce, the Marshall University School of Medicine served as one of four grant-funded pilot sites to implement the C-Change Cancer Core Competency Initiative. Each pilot site utilized a rigorous set of competency standards, curriculum design tools, and evaluation methods to create their programs. The Marshall Program strengthened the knowledge, skills, and attitudes of second year medical students with regard to breast cancer screening and patient communication. As a supplement to the standard curriculum, students participated in a Women's Health Workshop which incorporated interactive learning stations in the areas of radiology, pathology, oncology, patient communication and ethics. As a result of the program, participant knowledge regarding breast cancer improved 119%. Observations of medical students by attending physicians indicated skill improvements in performing a history and physical related to breast cancer screening. Standardized patients also indicated skill improvements in communication. Student confidence also improved. All four pilot sites experienced benefits beyond those derived by the participant including positive effects such as professional development, institutional visibility, and community relations, which are discussed in the companion report.

General Introduction & Overview

In February 2007, C-Change, a 501(c)(3) organization comprised of the top leaders from public, private, and non-profit organizations, embarked on a national validation project to address the Cancer Workforce crisis. Integral to providing cancer care across the continuum from prevention to survivorship is having a workforce that is quantitatively robust enough *and* qualitatively competent to address the needs of our communities locally, nationally, and globally.

In collaboration with a multidisciplinary expert panel, C-Change defined a set of core competencies in cancer care targeting the non-oncology workforce. To achieve the greatest possible uptake of the cancer core competencies in the health care, public health, and academic settings, C-Change released a Request for Proposals (RFP), soliciting proposals from organizations that supported educational offerings to Tier 2 professionals. Tier 2 professionals include licensed, registered, or certified members of health professions who have not specialized in cancer yet whose scope of practice includes face-to-face contact with patients and their families along the continuum of cancer care (Smith & Lichtveld, 2007).

The scientifically robust methodology deployed in the development of the competencies enabled pilot testing and validation in a fashion that assures the broadest utility across the non-oncology disciplines. The findings and lessons learned will inform the final set of competencies and will be shared with those who can take the next steps towards dissemination and implementation. In addition to the Marshall University School of Medicine, Huntington, WV, the three pilot sites selected were the Audrain Medical Center, Mexico, MO; the California University of Pennsylvania School of Social Work, California, PA; and the University of Pittsburgh Medical Center, Pittsburgh, PA.

Figure 1 illustrates the Cancer Core Competency Program Development Process, which includes three primary phases: Planning, Implementation, and Evaluation. In the Planning Phase, pilot sites defined program goals – to improve the competency of a target professional population on a specific cancer topic. With specific competency objectives in mind, they were able to identify the most appropriate array of educational interventions to achieve the desired knowledge and skills defined by the competency statements. Planning efforts also included the development of curriculum materials and evaluation tools to assess the impact of the educational intervention. The Implementation Phase entailed providing the educational experience for program participants and gathering evaluation data. During the Evaluation Phase, the data were analyzed to assess changes in knowledge, skills, and attitudes, and ultimately, achievement of the competency goals.

Site Specific Background and Rationale

Generally speaking, medical students do not have a great deal of patient contact or the opportunity to apply knowledge learned in the classroom during their first two years of training. As a result, students are academically prepared regarding cancer and other health care issues but are limited in their ability to integrate this knowledge into an actual patient interaction. Most patient encounters are presented in clinical vignette format, a mentoring experience, or through the usage of models or simulators that is limited to a physical examination practice session. Students have limited opportunities to experience continuity with a patient by reviewing the same patient's test results, delivering bad news to the patient, and reviewing treatment options. This project focused on incorporating several basic competencies of cancer prevention and early detection and providing the medical students with an opportunity to conduct a well women

patient visit, diagnose a breast lump, and refer the patient for additional testing using actual clinical findings and standardized patients.

Cancer Core Competency Program Development Process Marshall University School of Medicine – Huntington, WV

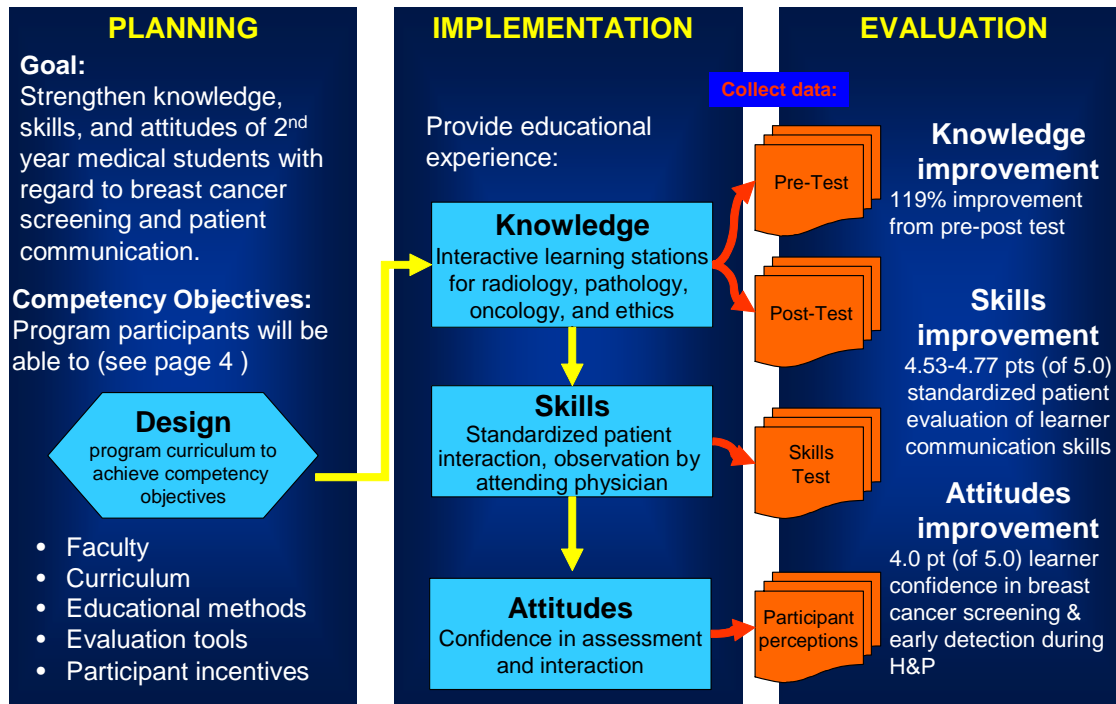


Figure 1: Marshall University School of Medicine Program Development Process

Methods

A Working Group (comprised of the course directors from the “Pathology and Approach To Patient Care Courses,” the Director of the Standardized Patient Program and Clinical Skills Lab and the Project Coordinator) was established to identify the C-Change Competencies which provided the foundation of the project. Logic models and validation templates (Appendices A & B) were also developed to guide curriculum development, educational methods, and evaluation tools that would most effectively strengthen the students’ clinical and interpersonal knowledge, skills, and attitudes. The Curriculum Dean, Radiology and Oncology faculty and the Curriculum Committee Chair were also consulted. The following C-Change Domain I and III Competencies were selected as they relate to breast cancer:

Competency Statements

Domain I: Continuum of Care

A) Prevention and Behavioral Risks

- **Screening and Early Detection**

- **General**

- Explain the benefits and risks of screening tests.
- Explain the possible findings from a screening test.
- Refer individuals for further assessment based upon screening test results.
- Perform an individualized cancer risk assessment based upon a comprehensive health history and current health status including genetic risk factors.
- Refer individuals to resources for cancer screening and risk assessment.
- Explain the role of diagnostic examinations in the identification of suspected cancer.
- Incorporate evidence-based cancer prevention guidelines in professional practice.
- Explain the continuum of comprehensive cancer care: prevention, early detection, treatment, survivorship, and palliative care.
- Refer individuals to resources for cancer prevention, screening, and management of precancerous conditions.
- Describe evidence based early detection guidelines based upon risk-factors.

- **Breast**

- Describe the methods of breast cancer detection, including breast self examination, clinical breast examination and mammography.
- Perform a clinical breast examination.
- Refer for follow-up assessment.

Upon further review of program design, implementation and evaluation, it became apparent that the following competencies were included in the curriculum development but were not formally cited in the validation template or formally evaluated:

Domain III: Collaboration and Communication

- Incorporate psychosocial communication strategies in conveying cancer information.
- Describe common ethical and legal issues in cancer care.
- Access institutional and other ethics resources.
- Advocate for the use of advanced directives, including the right to refuse care.

Course directors in Pathology, Microbiology, Approach to Patient Care, Psychopathology and Ethics, incorporated the C-Change Cancer Core Competencies into the Women's Health Workshop course curriculum. The Curriculum Dean, Radiology and Oncology faculty and the Curriculum Committee Chair were also consulted in the program design. In addition, the course directors developed a case study utilizing a standardized patient. To standardize physical findings, breast and pelvic models were purchased and utilized.

Prior to lectures on women's health issues, a pre-test was given to assess basic cancer core competency clinical knowledge. The pre-test was comprised of seventeen multiple-choice

questions and written by the appropriate course director. The only exception was the Radiology questions that were developed by a fourth year student. Medical students participated in two standardized patient interactions. The first was a “Well Woman Visit.” Prior to the Women’s Health Workshop, students interviewed standardized patients to obtain a health history and physical examination. Interviews were conducted prior to the Women’s Health Workshop as part of the “Approach to Patient Care” course in an effort to maximize station time during the Women’s Health Workshop. Students conducted a history and physical examination on a standardized patient who portrayed a forty-five year old female presenting for a wellness health check up. A breast mass was placed in the left upper outer quadrant of the anatomical breast model vest for standardization of an abnormal finding. Students were evaluated by standardized patients and attending physicians.

The second standardized patient interaction occurred at the end of the Women’s Health Workshop. First, students were divided into four groups and rotated through a series of “stations” for approximately 25 minutes per station to fulfill the noted competency goals. The faculty reviewed the standardized patient’s test results or case study data pertinent to each particular station including radiology, pathology, ethics, behavioral medicine, oncologic management of disease, and delivering bad news. The pathology and radiology sessions exposed students to a brief lecture and presentation of normal and abnormal findings including indications for further testing. Students viewed pathology slides of breast tissue under microscopes and various mammography, ultrasound, and MRI images. Case studies highlighting possible emotional and ethical issues with a breast cancer diagnosis and treatment were presented. The management of disease station discussed common modalities and agents used in cancer treatment. Finally, the delivering bad news station prepared students for their final standardized patient interaction by discussing effective and appropriate communication strategies. At the conclusion of the workshop, students met with their previously assigned standardized patient to discuss her test results; it was their first experience delivering bad news. Students were then given a post-test (Appendix C) at the conclusion of the day to assess their knowledge, skills, and attitudes about breast cancer.

RESULTS

The total number of instructional hours for this project was 2,273. This number was calculated by multiplying the number of instructional hours by the number of people taught. The total number of instruction hours not only indicates the investment made in the program but also the potential impact of the program. The large number of instructional hours for this program indicates both a large investment per person (42 hours) and large number of student participation (54) in both the Health Workshop and standardized patient interactions.

Pre and Post-Test Results

Table 1 indicates changes in the pre and post-test results. Fifty-four second-year students participated in the pre and post-test. The examinations consisted of the same 17 multiple-choice questions. Students were given as much time as needed to complete the examination.

Students increased their overall score by an average of 5 questions or from a 45% correct for the pre-test to 76% for the post-test. Average test scores dropped by 40% for question 10. The low score is attributed to the fact that students had not yet taken the Pharmacology course in which this content is taught. For questions 7 and 10, the post-test scores were lower than the pre-test scores, indicating further intervention

Table 1: Marshall University Pre/Post Test Results

Joan C. Edwards School of Medicine Marshall University Pre/Post Test Data n=54 Multiple-Choice Test Questions		Pre-Test # correct of 54	Post-Test # correct of 54	Absolute Change	Percent Change
1	A 45-year-old woman presents with a rash on her right breast, which has been present for months. On examination, you note a red, scaling crusty patch on her right nipple, areola and surrounding area. Left breast is normal. You suspect:	12	52	40	333.3%
2	A 52-year-old woman is seen for routine breast examination. You note inversion of the left nipple, which was not present last year, and she states she noted it a few weeks ago. You suspect:	25	54	29	116.0%
3	A 47-year-old female presents with a breast mass. The feature of this mass consistent with fibrocystic disease is:	16	43	27	168.7%
4	A 45-year-old female complaining of breast tenderness of about one week's duration. She is on no medicines and has had a tubal ligation. Her last period was 25 days ago and she has a regular 28-day cycle. She started her periods at age 10; she has had two children at age 24 and 27.	34	53	19	55.88%
5	On examination you note a round, tender mass which is freely movable in the upper outer quadrant of her right breast. She now tells you she notes this every month. You would:	28	45	17	60.71%
6	A 60-year-old woman presents with a breast mass she noted in the shower last night. She is very worried because her mother had breast cancer. You note a firm, fixed non-tender mass about 2 cm in size in the upper outer quadrant of the right breast. In her examination you evaluate the areas of lymphatic drainage of the breast as well. You examine:	15	23	8	53.33%
7	A 57 year-old female with a positive family history of breast cancer and a 2 cm mass in the left breast has a Fine Needle Aspiration (FNA) performed and the results reveal no definite malignant cells, the next appropriate step of diagnosis would be:	33	30	-3	-9.09%
8	You are teaching a fellow classmate about the technique of FNA. Which of the following statements is true?	6	51	45	750.0%
9	Which cancer chemotherapeutic agent is useful in breast cancer patients because their tumor was estrogen receptor positive?	27	52	25	92.59%
10	Which cancer chemotherapeutic agent is not normally used to treat non-metastatic breast cancer?	10	6	-4	-40.00%
11	Which of the following drugs is a monoclonal antibody used in breast tumors over expressing HER2 protein?	8	26	18	225.0%
12	You are seeing a 45-year-old female for the first time. While discussing the importance of preventive medicine and health screening with the patient, she asks what the advantage of mammography is. You tell her that it can:	40	48	8	20.00%
13	A 45-year old female presents with a 2-3cm firm, painless, freely movable mass in her left breast. She reports that the mass does not change during her menstrual cycle and has grown slowly over the past year. The patient found the mass during breast self-examination. Mammography showed the following. What is the most likely diagnosis?	29	38	9	31.03%
14	A 45-year-old woman undergoes routine screening and has an abnormal mammogram with multiple small calcifications in a linear pattern. The mammogram findings are shown below. A fine needle aspiration biopsy of an abnormal density reveals suspicious cells. What is the most likely diagnosis?	27	39	12	44.44%

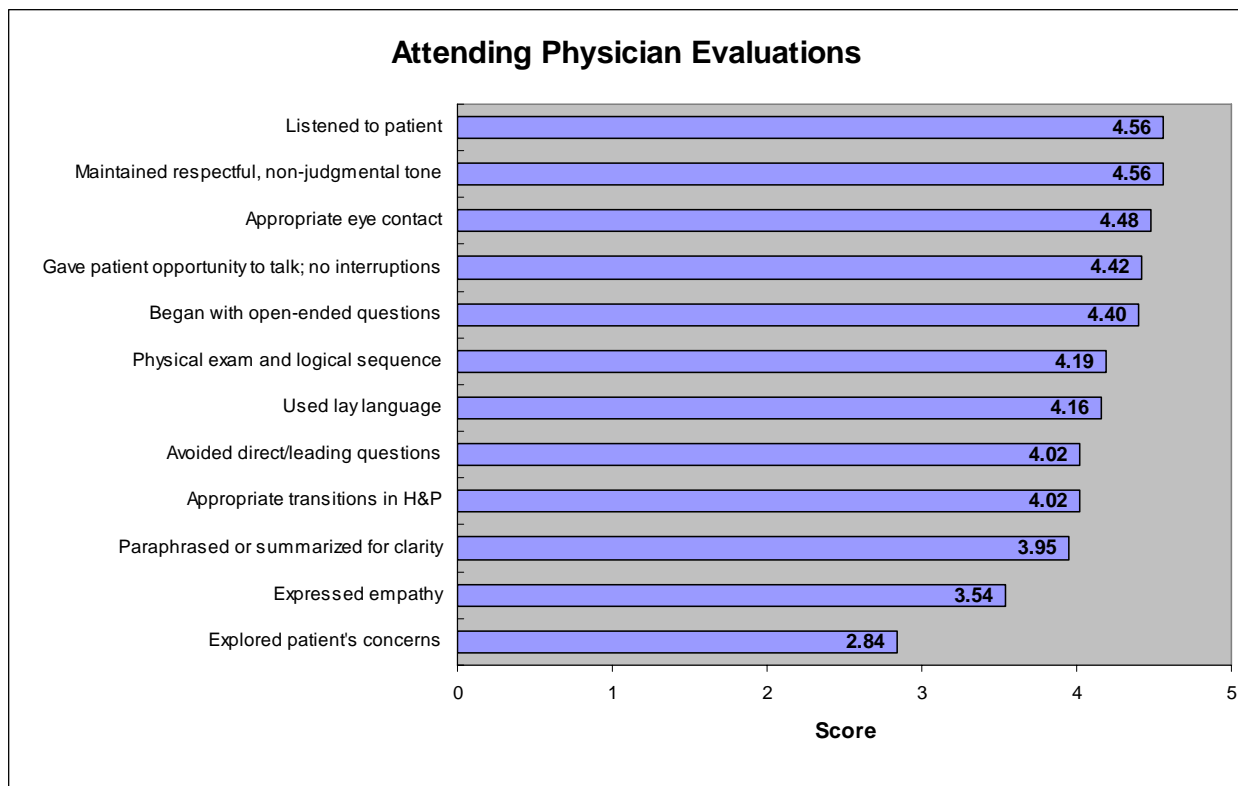
Table 1 Continued: Marshall University Pre/Post-Test Results

Joan C. Edwards School of Medicine Marshall University Pre/Post Test Data n=54		Pre-Test	Post-Test	Absolute Change	Percent Change
Multiple Choice Test Questions		# correct of 54	# correct of 54		
15	A 45-year-old woman undergoes routine screening and has an abnormal mammogram with multiple small calcifications in a linear pattern. The mammogram findings are shown below. A fine needle aspiration biopsy of an abnormal density reveals suspicious cells. What is the most likely diagnosis?	29	38	9	31.03%
16	After extensive evaluation, the treating physician recommends surgery to excise a cancerous mass, followed by low-level radiation treatment and aggressive post-treatment monitoring. However, the patient asks the physician to provide a double mastectomy (which is prophylactic for the breast with no evident cancer). Her fears about the cancer appear to be irrationally severe with respect to the risk. Although the physician expresses confidence that less drastic treatment will be effective, the patient continues to demand a double mastectomy. Faced with this circumstance, the physician should:	34	50	16	47.06%
17	During a discussion with a patient about her breast cancer, the patient reveals a previously unknown family history of breast and ovarian cancer. Subsequent test results indicate that the patient is a carrier of the BRCA2 gene mutation. After discussing treatment options, the physician recommends that the patient inform her younger sister of her potential risk for breast and ovarian cancer, given the test results. Although the younger sister is not a current patient of the physician, the physician knows the sister socially, since (s)he has lived in the community for many years and treated various members of the patient's family. However, the patient adamantly refuses to inform her sister. The patient does not trust her sister, claims her sister is a liar and uses illicit drugs. The patient is afraid that if information about her health status emerges, then her employment opportunities could be affected. Faced with this circumstance, the physician should:	36	53	17	47.22%
Average:		24.06	41.24	17.18	
Average Percent Correct:		45%	76%		119.25%

Physician Faculty Evaluation History & Physical

Figure 2 represents attending physician evaluations of second year medical students in their interpersonal communication skills with standardized patients. Possible ratings were on a scale from 1-5, with a 1 indicating minimal competency, a 3 indicating average competency, and a 5 indicating maximum competency. Students displayed high levels of competence listening to the patient, maintaining a respectful and non-judgmental tone while less competence was displayed when expressing empathy and exploring patient concerns. Overall, average ratings ranged from 2.84 to 4.56, the lowest average rating pertaining to the student's ability to explore patient concerns and the highest average pertaining to the student's ability to listen to the patient.

Figure 2: Attending Physician Evaluations



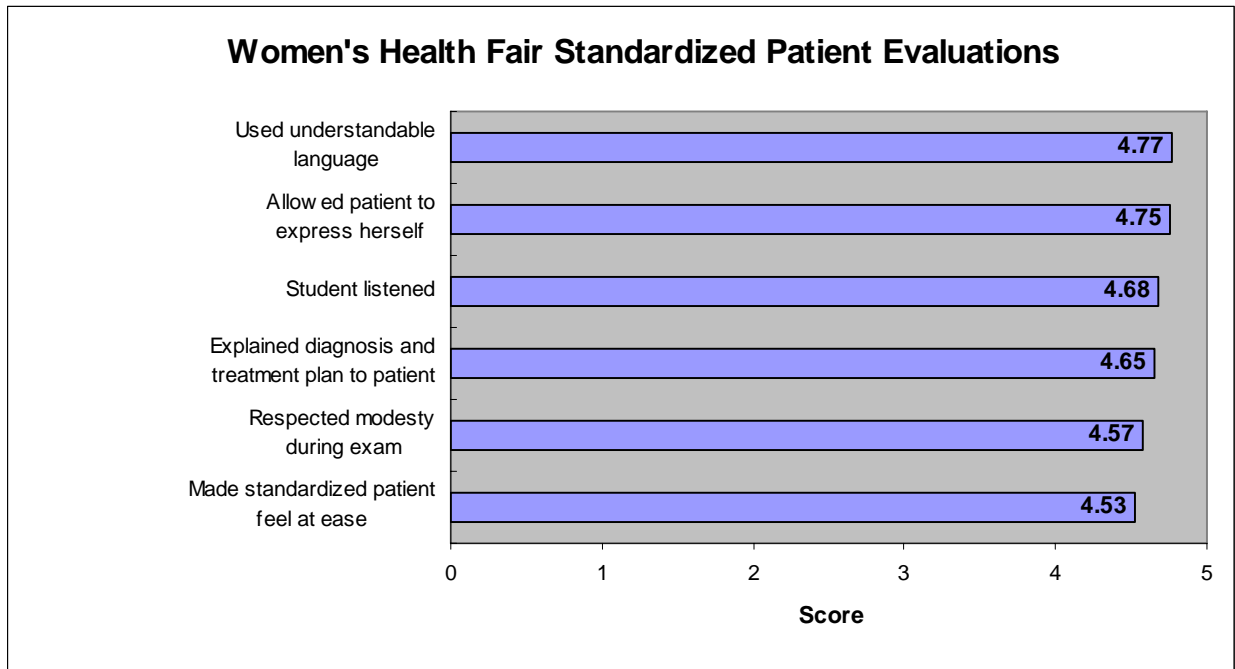
Standardized Patient Evaluation History & Physical Results

Figure 3 refers to standardized patient evaluations from the first encounter involving a history and physical exam. Potential ratings for the standardized patient evaluations were on a scale of 1-5, with 1 indicating minimal competency and 5 indicating maximum competency. Average ratings in the overall study tightly ranged from 4.53 to 4.77, the lowest average pertaining to the students' ability to make the patient feel at ease and the highest pertaining to the students' use of language clearly comprehensible by the standardized patient. Unexpectedly, the response rate for the question evaluating the students' ability to explain the diagnosis and treatment plan was only answered for approximately a third of the student encounters by the standardized patients. However, the average rating for the task was 4.65, indicating that those students who made a conscious effort to explain the diagnosis and treatment plan to the patient, did so with confidence and success.

Standardized Patient Evaluation Results of Delivering Bad News

Figure 4 represents standardized patient evaluations of medical students and their abilities to deliver bad news appropriately with regard to the diagnosis of a new breast malignancy. Possible ratings were on a scale of 1-3, with 1 indicating the student had inadequate communication skills, 2 indicating somewhat adequate skills, and 3 indicating excellent communication skills when related to delivering bad news. The total number of responses for all tasks was 22, with the exception of the task of listening, which received 21 responses. Average ratings for the delivery of bad news checklist ranged from 2.95 to 3.00.

Figure 3: Standardized Patient Evaluations



Each pilot site utilized five questions that were common across all pilot sites. The C-Change team developed these questions; pilot sites tailored the questions to reflect site specific training content and were listed at the end of each post-test. The questions allowed for aggregated assessment across sites regarding the relevance of the training, increased in learner confidence to provide cancer care, learner intentions to change practice, learner intentions to suggest the training to colleagues, and level of learner knowledge of the shortages in the cancer workforce. Learner attitudes and intentions are antecedents of behavior, therefore, these measures served as predictive indicators of longer term outcomes, such as changes in practice. Respondents were asked to rank each of the domains using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Figure 5 illustrates student responses to five Common Questions regarding the relevance and impact of the Women's Health Workshop to their medical education. Students were asked to rate characteristics of the Women's Health Workshop, with 1 being the lowest and 5 being the highest possible score. Question number four received the highest average score of 3.91 indicating that students would suggest to the faculty that the Women's Health Workshop should be used for the following academic year. Conversely, question number five indicating the extent to which students were considering Hematology/Oncology or Radiation Oncology as a career choice received the lowest average score of 2.25. Additional questions solicited responses from students regarding their confidence and abilities pertaining to screening and early detection practices.

Figure 4: Delivering Bad News

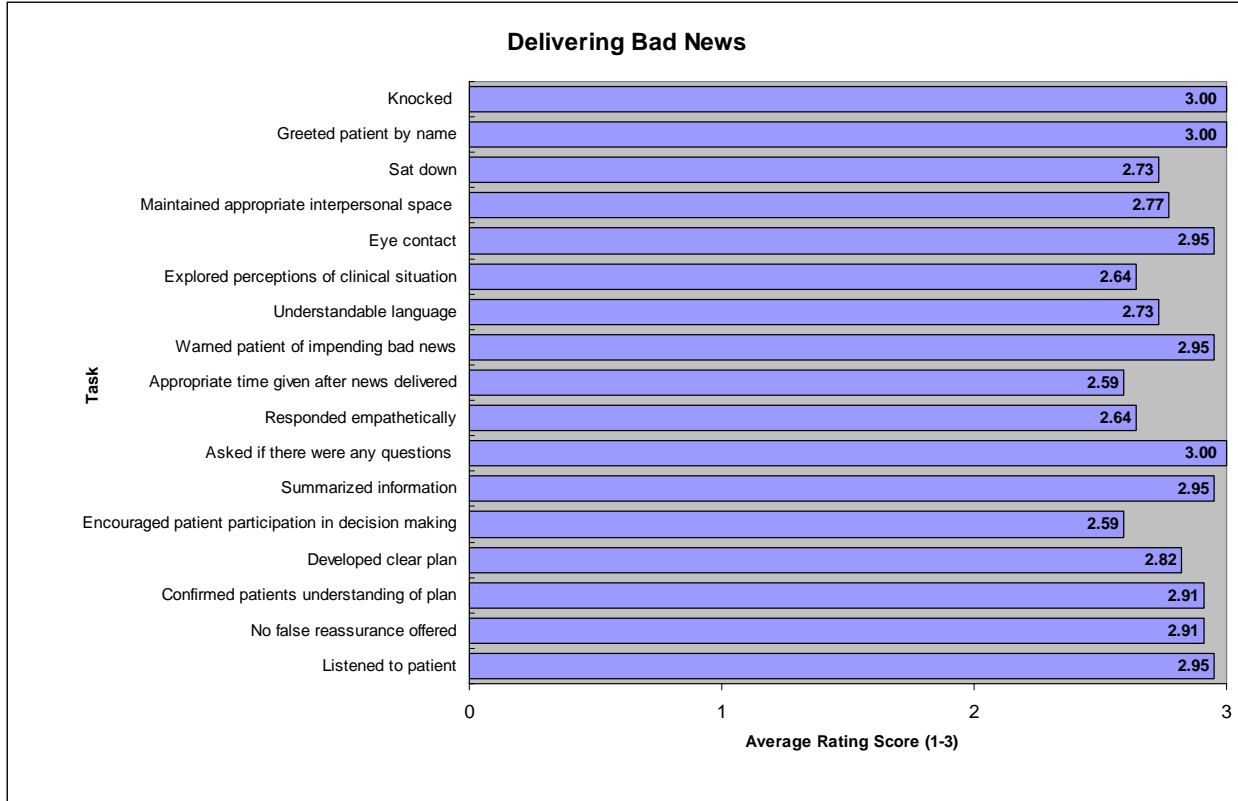
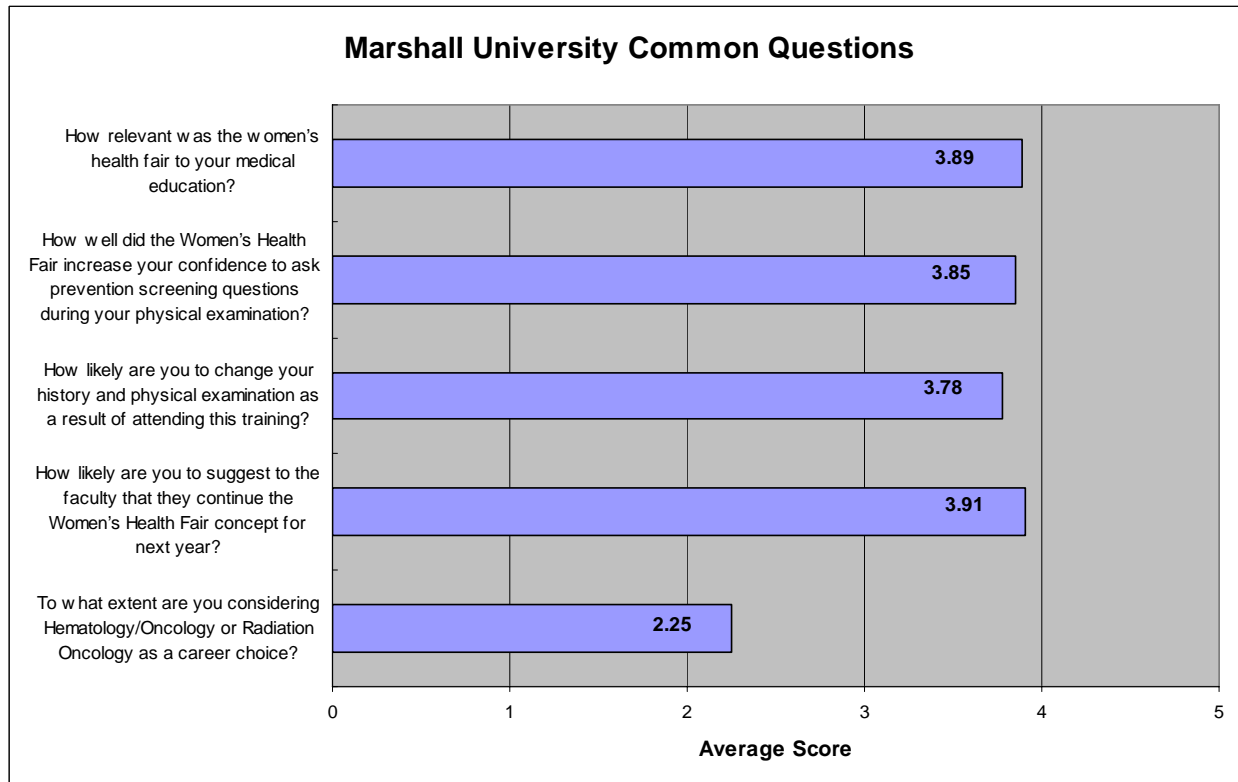


Figure 5: Marshall University Common Question Data



Lessons Learned from the Program

The innovative use of stations in the Women's Health Workshop provided an extremely effective teaching method to integrate clinical knowledge of breast cancer screening and early detection with patient interactions. In the past, students were taught without the use of standardized patients and there was no opportunity to practice interacting with patients. In addition, breast models were not utilized. Traditionally, curriculum is passive. Students listen to the lectures. This format encouraged students to be active learners and the results from the post-test, faculty, and standardized patient interactions indicated that it was effective.

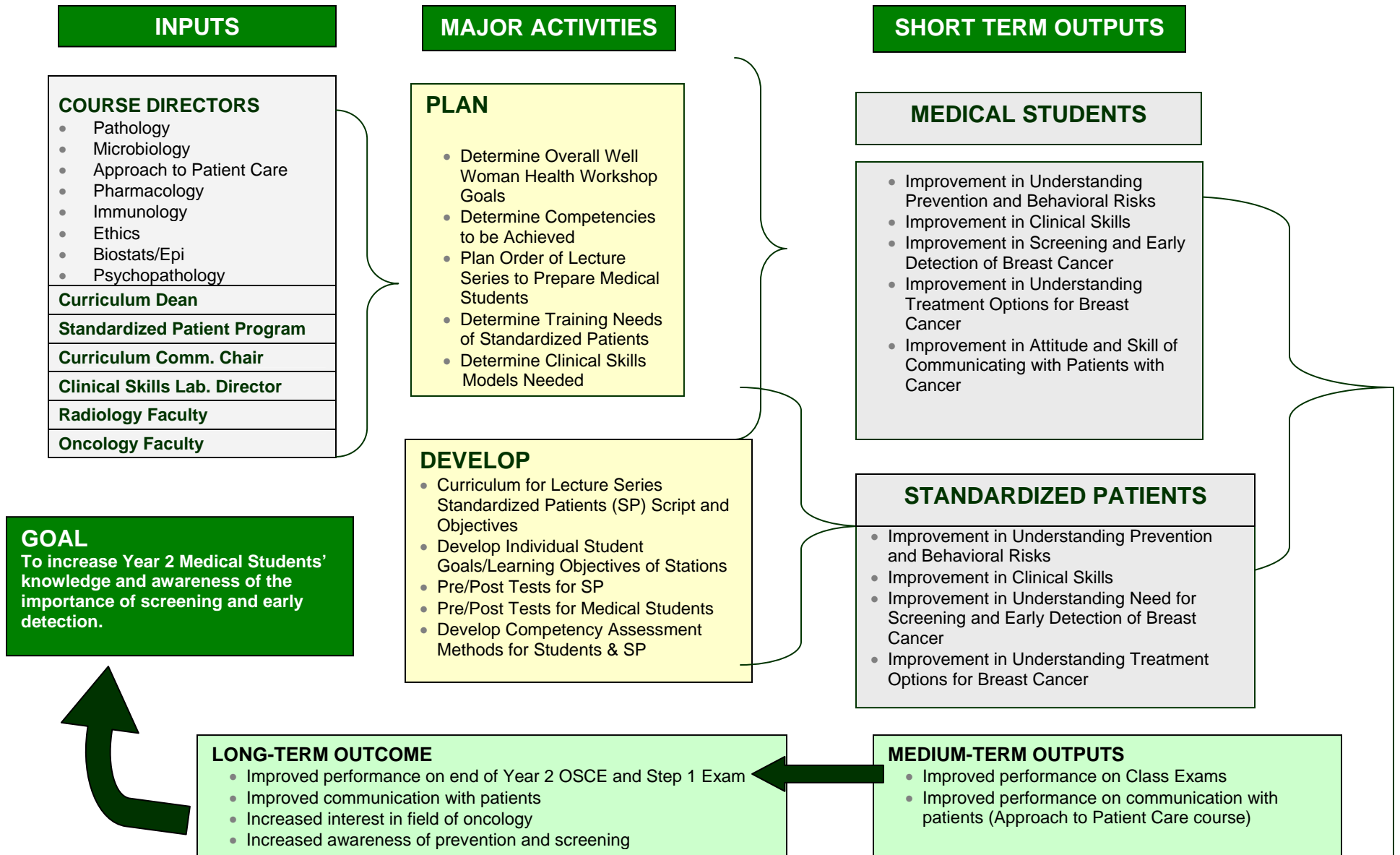
Early planning and involvement by the course directors is necessary to ensure all objectives are met. It is imperative to have the participation of course directors in the development of all aspects of this project – from the logic model and validation template development to the submission of pre and post-test questions. In the future, test questions will be written by the faculty member who is teaching. This provides continuity and careful application of the competencies as they relate to integrated curriculum design, course objectives, and evaluation tools. It will be beneficial to include the Women's Health Workshop as part of the academic calendar to allow for an all day event. While our experience was positive, students were tired at the conclusion of the half-day event and not able to effectively transition to a passive lecture planned for the afternoon session.

In addition, it became apparent that students needed to discuss their experiences after delivering bad news of a cancer diagnosis to the standardized patient, as it was emotional for them. A debriefing station could be included to allow students to talk about how this station affected them. An additional consideration for future Women's Health Workshops would be the inclusion of fourth-year medical students in the program design and implementation. This group of students could be helpful as they could help organize, teach at the stations, and evaluate students. Elective credit may be offered to reward the senior students for their participation.

Discussion of Next Steps

Both the program content and methods/format of the Women's Health Workshop will contribute to the sustainability of the program. In terms of program content, the investment in developing and securing approval for the breast cancer-focused material within the medical school curriculum will be sustained and possibly expanded. The Curriculum Committee is reviewing a request to include a full day Women's Health Workshop during the next academic year. This daylong event will allow faculty leaders to delve more deeply into course content as well as facilitate greater student involvement. In terms of the program methods/format, the Health Workshop format is now being applied to develop the Men's Health Workshop that will occur in the Spring term. Key to sustaining the workshop format will be to secure funding for models, standardized patients, and training. Curriculum development has proven to be resource intensive. However, once the course content has been developed, repetition and sustainability year after year will not be as challenging. Health care professional schools could easily adapt this format to fit their curriculum. Different types of "workshops" could be planned to focus on the school's competencies and learning priorities.

**Appendix A
MARSHALL UNIVERSITY SCHOOL OF MEDICINE
C-CHANGE LOGIC MODEL**



Appendix B

Project Name:	Marshall University School of Medicine Women's Health Workshop
Competency:	Prevention and Behavioral Risks
Sub-competencies:	<p>1) General Incorporate evidence-based cancer prevention guidelines in their professional practice. Explain the continuum of comprehensive cancer care: prevention, early detection, treatment, survivorship, and palliative care. Refer individuals to resources for cancer prevention, screening, and management of precancerous conditions. Describe evidence based early detection guidelines based upon risk-factors.</p>
Learner Characteristics:	MS 2 students
Learner Preparation:	Students will be front-loaded with lectures on prevention and behavioral risks, on physical exam skills and history taking.

Instructional Activities	Evaluation Strategies	Indicators	Notes to the Instructors
Well Woman Visits	Pre-test/Post SP Checklist	<p>Ability to communicate benefits of screening tests.</p> <p>Ability to ask pertinent questions about risks for breast cancer.</p>	Since these are beginning Year 2 students, this exercise is designed to identify the knowledge base of the students.
Radiology Station	Pre/Post Test	List indicators for mammography and limitations.	

Instructional Activities	Evaluation Strategies	Indicators	Notes to the Instructors
		List alternative radiological evaluation methods	
Pathology Station	Observational	Students will look at histologic slides of mammotome biopsy, excisional breast biopsy, needle biopsy.	
Delivering Bad News	Checklist	Ability to present bad news in appropriate and understood manner	
Remedial Activities:	For those learners who have difficulty completing any component, extra sessions will be scheduled.		
Enhancement Activities:	Extra Sessions can be arranged for STD clinic at Health Department		

Project Name:	Marshall University School of Medicine Women's Health Workshop
Competency:	Screening and Early Detection
Sub-competencies:	<p>General</p> <ul style="list-style-type: none"> Explain the benefits and risks of screening tests. Explain the possible findings from a screening test. Refer individuals for further assessment based upon screening test results. Perform an individualized cancer risk assessment based upon a comprehensive health history and current health status including genetic risk factors. Refer individuals to resources for cancer screening and risk assessment. Explain the role of diagnostic examinations in the identification of suspected cancer. <p>Breast</p> <ul style="list-style-type: none"> Describe the methods of breast cancer detection, including breast self examination, clinical breast examination and mammography. Perform a clinical breast examination. Refer for follow-up assessment.
Learner Characteristics:	MS 2 students/ Standardized Patients
Learner Preparation:	Students will be front-loaded with lectures on Screening and Early Detection of Breast Cancer

Instructional Activities	Evaluation Strategies	Indicators	Notes to the Instructors
<p>Patient Interview (SP encounter, Phys. Exam)</p> <p>Students will be presented with a patient for a Well-Woman visit. A Standardized Patient (SP) will be used.</p>	SP Checklist	<p>Ability to gather history relevant to breast cancer.</p> <p>Ability to communicate benefits and risks of screening tests; possible findings.</p>	SP's will have to be carefully selected and trained to evaluate the students.

Instructional Activities	Evaluation Strategies	Indicators	Notes to the Instructors
Breast and pelvic models will be used	Students will detect lump in breast model	Ability to detect lump in breast model and need for screenings.	
Remedial Activities:	For those learners who have difficulty completing the History and Physical Examination, or Communication Skills component, extra sessions will be scheduled.		
Enhancement Activities:	For students who are interested in learning about cancer care, preceptor sessions can be arranged at Cancer Center.		

Appendix C

Women's Health Workshop Post Test Exam Questions November 9, 2007

1. A 45-year-old woman presents with a rash on her right breast, which has been present for months. On examination you note a red, scaling crusty patch on her right nipple, areola and surrounding area. Left breast is normal. You suspect:
 - A. Intraductal papilloma
 - B. Eczema
 - C. Pagets disease
 - D. Inflammatory carcinoma

2. A 52-year-old woman is seen for routine breast examination. You note inversion of the left nipple, which was not present last year, and she states she just noted it a few weeks ago. You suspect:
 - A. Malignancy
 - B. Pagets
 - C. Normal variant with aging
 - D. Fibrocystic changes

3. A 47-year-old female presents with a breast mass. The feature of this mass consistent with fibrocystic disease is:
 - A. It goes away after her period
 - B. It is nontender
 - C. It is irregular in its borders
 - D. It is hard and fixed

4. A 45 year-old female complaining of breast tenderness of about one week's duration. She is on no medicines and has had a tubal ligation. Her last period was 25 days ago and she has a regular 28-day cycle. She started her periods at age 10; she has had two children at age 24 and 27.

Her most important risk factor for breast cancer would be:

 - A. Her current age
 - B. Her age at menarche
 - C. Her age at the birth of her children
 - D. Her tubal ligation

5. On examination you note a round, tender mass which is freely movable in the upper outer quadrant of her right breast. She now tells you she notes this every month. You would:
 - A. Send her for biopsy
 - B. Send her for a mammogram

- C. Send her for ultrasound of her breast
 - D. Re-examine her after her period
6. A 60-year-old woman presents with a breast mass she noted in the shower last night. She is very worried because her mother had breast cancer. You note a firm, fixed nontender mass about 2 cm in size in the upper outer quadrant of the right breast. In her examination you evaluate the areas of lymphatic drainage of the breast as well. You examine:
- A. The axillary area
 - B. The axillary area and supraclavicular area
 - C. The supraclavicular area
 - D. The axillary area and the internal mammary nodes
7. A 57 year-old female with a positive family history of breast cancer and a 2 cm mass in the left breast has a Fine Needle Aspiration (FNA) performed and the results reveal no definite malignant cells, the next appropriate step of diagnosis would be:
- A. Mastectomy
 - B. Excisional biopsy
 - C. Assure patient things are okay
 - D. CT scan
8. You are teaching a fellow classmate about the technique of FNA. Which of the following statements is true?
- A. Use of a large needle ensures a large yield of diagnostic cells
 - B. Shearing action of the needle is most critical in obtaining cellular material
 - C. Obtaining a large amount of blood guarantees a good diagnostic cell yield
 - D. The aspiration component of the technique is most important in ensuring a high yield of cells
9. Which cancer chemotherapeutic agent is useful in breast cancer patients because their tumor was estrogen receptor positive?
- A. Doxorubicin
 - B. Cyclophosphamide
 - C. Tamoxifen
 - D. Epirubicin
 - E. Fluorouracil
10. Which cancer chemotherapeutic agent is not normally used to treat non-metastatic breast cancer?
- A. Cyclophosphamide
 - B. Doxorubicin
 - C. Epirubicin
 - D. Fluorouracil
 - E. Vinorelbine

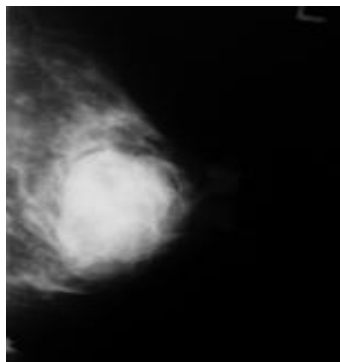
11. Which of the following drugs is a monoclonal antibody used in breast tumors overexpressing HER2 protein?

- A. Trastuzumab
- B. Gemcitabine
- C. Racamab
- D. Mitoxantrone
- E. Lucimab

12. You are seeing a 45-year-old female for the first time. While discussing the importance of preventive medicine and health screening with the patient, she asks what the advantage of mammography is. You tell her that it can:

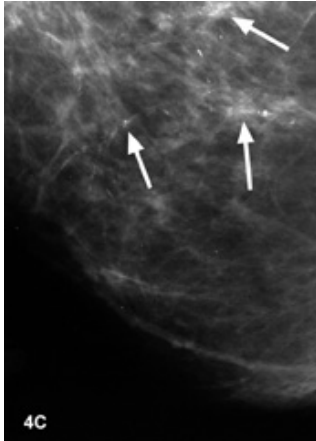
- A. Identify suspicious lesions 2 or more years before they are palpable
- B. Assess the degree of spread of malignancy
- C. Differentiate between benign and malignant conditions
- D. Provide reassurance about suspicious masses

13. A 45-year old female presents with a 2-3cm firm, painless, freely movable mass in her left breast. She reports that the mass does not change during her menstrual cycle and has grown slowly over the past year. The patient found the mass during breast self-examination. Mammography showed the following. What is the most likely diagnosis?



- A. Intraductal carcinoma
- B. Fibroadenoma
- C. Ductal ectasia
- D. Fibrocystic changes

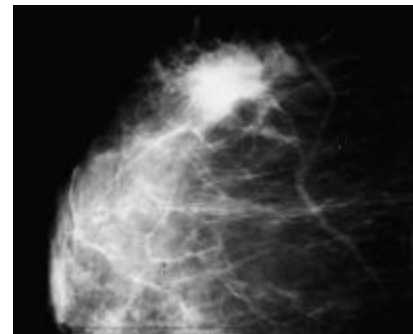
14. A 45-year-old woman undergoes routine screening and has an abnormal mammogram with multiple small calcifications in a linear pattern. The mammogram findings are shown below. A fine needle aspiration biopsy of an abnormal density reveals suspicious cells. What is the most likely diagnosis?



- A. Lobular carcinoma in situ
- B. Fat necrosis
- C. Ductal carcinoma in situ
- D. Intraductal papilloma

15. A 45-year-old woman undergoes routine screening and has an abnormal mammogram showing multiple small areas of increased density, though a single distinctive mass lesion is not detectable by palpation.

A fine needle aspiration reveals cells suspicious for malignancy. An excisional breast biopsy yields a diagnosis of lobular carcinoma in situ. Which of the following is the most likely finding associated with this woman's carcinoma?



- A. The neoplasm will remain localized.
- B. The opposite breast may also be involved.
- C. Paget disease of the nipple probably preceded this lesion.
- D. A family history of breast cancer is unlikely.

16. After extensive evaluation, the treating physician recommends surgery to excise a cancerous mass, followed by low level radiation treatment and aggressive post-treatment monitoring. However, the patient asks the physician to provide a double mastectomy (which is prophylactic for the breast with no evident cancer). Her fears about the cancer appear to be irrationally severe with respect to the risk. Although the physician expresses confidence that less drastic treatment will be effective, the patient continues to demand a double mastectomy. Faced with this circumstance, the physician should:

- A. Transfer care to a physician who is more comfortable fulfilling the patient's request
- B. Provide a surgical referral for double mastectomy, based on respect for patient autonomy
- C. Convene a meeting with other physicians, and proceed based on the consensus that emerges from the meeting
- D. Recommend a period of reflection about treatment options, schedule a follow-up appointment and suggest options for professional counseling/support groups
- E. Consult "House" to determine which rude insults might persuade the patient to change her mind

17. During a discussion with a patient about her breast cancer, the patient reveals a previously unknown family history of breast and ovarian cancer. Subsequent test results indicate that the patient is a carrier of the BRCA2 gene mutation. After discussing treatment options, the physician recommends that the patient inform her younger sister of her potential risk for breast and ovarian cancer, given the test results. Although the younger sister is not a current patient of the physician, the physician knows the sister socially, since (s)he has lived in the community for many years and treated various members of the patient's family. However, the patient adamantly refuses to inform her sister. The patient does not trust her sister, claims her sister is a liar and uses illicit drugs. The patient is afraid that if information about her health status emerges, then her employment opportunities could be affected. Faced with this circumstance, the physician should:
- A. Contact the sister's physician privately to inform him/her about the sister's unknown risk, based on the severity of the potential consequences
 - B. Contact the sister directly to inform her about her cancer risk
 - C. Threaten to fire the patient if she does not agree to inform her sister
 - D. Continue to talk with the patient about the importance of disclosure, but honor her refusal to disclose should she remain adamant
 - E. Discontinue any attempts to persuade the patient to inform her sister, because the potential for employment discrimination is very real